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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,057	03/19/2007	Csaba Szeles	4375-061141	4920
28389 7590 01/22/2009 THE WEBB LAW FIRM, P.C. 700 KOPPERS BUILDING 436 SEVENTH AVENUE PITTSBURGH, PA 15219				
EXAMINER				
IGYARTO, CAROLYN				
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2884				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/578,057

**Applicant(s)**

SZELES ET AL.

**Examiner**

CAROLYN IGYARTO

**Art Unit**

2884

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/ISD)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's response was received 10 October 2008. No amendment was received. Claims 1-7 are currently pending in this application.
2. Applicant's arguments filed 10 October 2008 have been fully considered but they are not persuasive.
3. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).
4. Three references in combination have been used in the rejection of claims 1-7.

Kazandjian teaches a radiation detector made from a compound comprising:  $\text{Cd}_x\text{Zn}_{1-x}\text{Te}$ , where  $0 \leq x \leq 1$  (Abstract; [0015]); an element from column III of the periodic table ([0015]) in a concentration about 10 to 10,000 atomic parts per billion ([0065]); and an additional element in a concentration about 10 to 10,000 atomic parts per billion ([0015] and [0065]).

Kazandjian does not explicitly teach the additional element is a rare earth element selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Kulwicki teaches doping a polycrystalline material with an element from column II of the periodic table and a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er (Abstract; col. 2, lines 2-9). Uekita teaches that examples of polycrystalline material are CdTe and ZnTe and that these materials are usually doped with rare earth elements (col. 2, lines 54-57; col. 3, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to try having the additional element, taught by Kazandjian, be a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er, as a person of ordinary skill has good reason to pursue the known options within his/her technical grasp.

5. In response to Applicants arguments that Kazandjian, Kulwicki, and Uekita do not disclose, teach, or suggest doping CdZnTe with one of the rare earth elements set forth in claim 1 in connection with a radiation detector. Kazandjian teaches a radiation detector made from a compound comprising:  $\text{Cd}_x\text{Zn}_{1-x}\text{Te}$ , where  $0 \leq x \leq 1$  (Abstract; [0015]); an element from column III of the periodic table ([0015]) in a concentration about 10 to 10,000 atomic parts per billion ([0065]); and an additional element in a concentration about 10 to 10,000 atomic parts per billion ([0015] and [0065]).

Kazandjian does not explicitly teach the additional element is a rare earth element selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Kulwicki teaches doping a polycrystalline material with an element from column II of the periodic table and a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er (Abstract; col. 2, lines 2-9). Uekita teaches that examples of polycrystalline material are CdTe and ZnTe and that these materials are usually doped with rare earth elements (col. 2, lines 54-57; col. 3, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to try having the additional element, taught by Kazandjian, be a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er, as a person of ordinary skill has good reason to pursue the known options within his/her technical grasp.

6. In response to Applicants arguments that Kazandjian, Kulwicki, and Uekita do not disclose, teach, or suggest the concentration of an element from column III or Column VII of the periodic table in concentration of 10 to 10,000 atomic parts per billion and the concentration of one of rare earth elements of claim 1 in a concentration of about 10 to 10,000 atomic parts per billion. Kazandjian teaches a radiation detector made from a compound comprising:  $\text{Cd}_x\text{Zn}_{1-x}\text{Te}$ , where  $0 \leq x \leq 1$  (Abstract; [0015]); an element from column III of the periodic table ([0015]) in a concentration about 10 to 10,000 atomic parts per billion ([0065]); and an additional element in a concentration about 10 to 10,000 atomic parts per billion ([0015] and [0065]).

Kazandjian does not explicitly teach the additional element is a rare earth element selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Kulwicki teaches doping a polycrystalline material with an element from column II of the periodic table and a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er (Abstract; col. 2, lines 2-9). Uekita teaches that examples of polycrystalline material are CdTe and ZnTe and that these materials are usually doped with rare earth elements (col. 2, lines 54-57; col. 3, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to try having the additional element, taught by Kazandjian, be a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er, as a person of ordinary skill has good reason to pursue the known options within his/her technical grasp.

7. Applicant argues that Uekita teaches away from the invention by disclosing the combination of rare earth metals with acceptors, not donors. The Examiner respectfully disagrees. Uekita demonstrates that examples of polycrystalline material are CdTe and ZnTe and that these materials are usually doped with rare earth elements (col. 2, lines 54-57; col. 3, lines 6-12). This does not teach away from the invention, but teaches the invention in combination with Kazandjian and Kulwicki.

8. The Interview Summary, mailed 20 October 2008, states that the international search report was received 10 October 2008. The Examiner would like to correct the date in which the international search report was received to 3 August 2007. This was discussed in the 15 October 2008 telephonic interview.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazandjian et al. (US 2003/0209184), hereinafter referred to as Kazandjian, in view of Kulwicki (US 5,314,651) and Uekita et al. (4,907,043), hereinafter referred to as Uekita.

12. With respect to **claim 1**, Kazandjian teaches a radiation detector made from a compound comprising:  $\text{Cd}_x\text{Zn}_{1-x}\text{Te}$ , where  $0 \leq x \leq 1$  (Abstract; [0015]); an element from column III of the periodic table ([0015]) in a concentration about 10 to 10,000 atomic parts per billion ([0065]); and an additional element in a concentration about 10 to 10,000 atomic parts per billion ([0015] and [0065]).

Kazandjian does not explicitly teach the additional element is a rare earth element selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

Kulwicki teaches doping a polycrystalline material with an element from column II of the periodic table and a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er (Abstract; col. 2, lines 2-9). Uekita teaches that examples of polycrystalline material are CdTe and ZnTe and that these materials are usually doped with rare earth elements (col. 2, lines 54-57; col. 3, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to try having the additional element, taught by Kazandjian, be a rare earth element such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, and Er, as a person of ordinary skill has good reason to pursue the known options within his/her technical grasp.

13. With respect to **claims 2-4 and 6**, Kazandjian teaches a method of forming a radiation detector compound comprising:

- (a) providing a mixture of Cd, Zn and Te ([0042]);
- (b) heating the mixture to a liquid state ([0022] lines 5-6; [0023] lines 2-4; [0042]; [0045]);
- (c) adding to the liquid mixture a first dopant ([0043]);
- (d) adding to the liquid mixture a second dopant ([0043]); and
- (e) solidifying said mixture including said first and second dopants to form the compound (claim 8).

Kazandjian does not explicitly teach that the first dopant adds shallow level donors (electrons) to the top of an energy band gap of said mixture when it is solidified or that the second dopant adds deep level donors and/or acceptors to the middle of said band gap of said mixture when it is solidified.

Kulwicki teaches doping polycrystalline with an element from column III of the periodic table, such as Al, Ga, or In, and a rare earth element, such as La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, or Er (Abstract). Doping with Al, Ga, or In will add shallow level donors (electrons) to the top of an energy band gap of said mixture when it is solidified. Doping with La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, or Er will add deep level donors and/or acceptors to the middle of said band gap of said mixture when it is solidified.

Uekita teaches that examples of polycrystalline material are CdTe and ZnTe and that these materials are usually doped with rare earth elements (col. 2, lines 54-57; col. 3, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to try having the first dopant, taught by Kazandjian, be Al,

Ga, or In, taught by Kulwicki, which will add shallow level donors (electrons) to the top of an energy band gap of said mixture when it is solidified and have the second dopant, taught by Kazandjian, be La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, or Er, as taught by Kulwicki, which will add deep level donors and/or acceptors to the middle of said band gap of said mixture when it is solidified as a person of ordinary skill has good reason to pursue the known options within his/her technical grasp.

14. With respect to **claims 5 and 7**, Kazandjian further teaches a concentration of the first dopant and of the second dopant in the compound is about 10 to 10,000 atomic parts per billion ([0015] and [0065]).

### ***Conclusion***

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROLYN IGYARTO whose telephone number is (571)270-1286. The examiner can normally be reached on Monday - Thursday, 7:30 A.M. to 5 P.M. E.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CI

/David P. Porta/

Supervisory Patent Examiner, Art Unit 2884